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Atoll garnets petrogenesis in the Bolandparchen metamorphic complex in southwest Mahneshan

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Abstract: Bolandparchen metamorphic complex located in the NW Zanjan city and is at the border of Central Iran and Sanandaj-Sirjan Zones. The study area contains different schists, impure marble and metsandstone that intruded by granitic bodies in the central and northern parts. Central part of Bolandparchen complex cut by NW to SE fault. Petrographic study, whole rock analysis, microprobe analyses and Backscatter Electron Image (BSE) from the Bolandparchen complex of the garnet mica schist shows that rocks contain two types of garnet that crystallized in different ages and thermodynamic conditions. Each type has zonal structure but on type shows disequilibrium atoll-like texture that saved metamorphic history events. It suggests that the last metamorphic phase in Bolandparchen complex occurred at 486 to 521˚c temperature and 3.2 to 3.8 kbar pressure. Evidence reveals that metamorphism began in higher conditions and cooled soon after uplift of the region to lower part of crust.

Keywords: *Atoll garnet; garnet mica schist; zonal structure; thermo barometry; Bolandparchen.*

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